

WHAT IS CLAIMED IS:

1. A process for the casting of metals, comprising the steps of:
providing a mold;
delivering a molten metal into the mold;
solidifying the molten metal; and,
5 removing at least a portion of the mold, wherein the step of removing the mold begins before the step of solidifying the molten metal has been completed.
2. The process of claim 1, wherein the steps of removing at least a portion of the mold and solidifying the molten metal are performed approximately simultaneously.
3. The process of claim 1, further comprising the step of continuing to deliver molten metal to the mold during the step of removing at least a portion of the mold.
4. The process claim 1, wherein the step of removing at least a portion of the mold includes the step of decomposing the mold.
5. The process of claim 1, wherein the step of delivering molten metal into the mold is accomplished by a gravity feed of the molten metal.
6. The process of claim 1, wherein the step of removing at least a portion of the mold includes the step of spraying the mold with a solvent.
7. The process of claim 6, wherein the step of spraying the mold with a solvent includes the step of adjusting a rate of spray of the solvent.
8. The process of claim 6, wherein the step of spraying the mold with a solvent includes the step of adjusting a pattern of spray of the solvent.

9. The process of claim 6, wherein the step of spraying the mold with a solvent includes the step of directing at least two streams of solvent onto the mold.

10. The process of claim 9, wherein a first stream of solvent is directed onto the mold at a different time than a second stream of solvent.

11. The process of claim 9, wherein a first stream of solvent is directed onto the mold at a different location than a second stream of solvent.

12. The process of claim 6, wherein the solvent includes at least one of a liquid, a gas and a grit material.

13. The process of claim 6, wherein the solvent is delivered at a rate of from about 0.5 to about 50.0 liters per second.

14. The process of claim 6, wherein the solvent is delivered at a pressure of from about 0.03 to about 70.00 bar.

15. The process of claim 6, wherein the mold includes at least one constituent, and the process further comprises the additional step of reclaiming at least one of the at least one constituent and the solvent.

16. A process for reducing the cooling time of a metal that has been cast, comprising the steps of:

providing a mold;

supplying molten metal to the mold;

spraying the mold with a solvent;

decomposing at least a portion of the mold with the solvent; and,

cooling the molten metal with the solvent.

17. The process of claim 16, wherein the step of spraying commences before the molten metal has completely solidified.

18. The process of claim 17, wherein the step of spraying commences shortly after the molten metal has been poured into the mold.

19. The process of claim 16 further comprising the step of supplying additional molten metal to the mold during said step of spraying the mold with the solvent.

20. The process of claim 16, wherein the step of spraying the mold with a solvent includes delivering the solvent at a rate of from about 0.5 to about 50.0 liters per second.

21. The process of claim 16, wherein the step of spraying the mold with a solvent includes delivering the solvent at a pressure of from about 0.03 to about 70.00 bar.

22. The process of claim 16, wherein the mold includes a binder and an aggregate, and further comprising the additional step of reclaiming at least one of the binder, aggregate and solvent.

23. The process of claim 16, wherein the step of spraying the mold with a solvent includes the step of adjusting a rate of spray of the solvent.

24. The process of claim 16, wherein the step of spraying the mold with a solvent includes the step of adjusting a pattern of the spray of the solvent.

25. The process of claim 16, wherein the step of spraying the mold with a solvent includes the step of directing at least two streams of solvent onto the mold.

26. The process of claim 25, wherein the two streams are spaced from each other so as to contact separate areas of the mold.

27. An apparatus for delivering a solvent to a mold during the casting of metals, comprising:

5 at least one nozzle having a solvent delivery rate of from about 0.5 to about 50.0 liters per second and a solvent delivery pressure of from about 0.03 bar to about 70.00 bar, whereby the mold is at least partly dissolved or removed by the solvent that is delivered while the casting is cooled.

28. The apparatus of claim 27, wherein the at least one nozzle includes two nozzles.

29. The apparatus of claim 28, wherein the two nozzles are located on opposite sides of the mold.

30. The apparatus of claim 28, wherein a first of the two nozzles sprays a greater volume of solvent than a second of the two nozzles.

31. The apparatus of claim 28, wherein a first of the two nozzles sprays solvent at a different time than a second of the two nozzles.

32. The apparatus to deliver a solvent of claim 28, wherein a first of the two nozzles sprays solvent in a different direction than a second of the two nozzles.

33. The apparatus to deliver a solvent of claim 27, wherein the at least one nozzle includes settings that are adjusted for the delivery of the solvent.

34. The apparatus to deliver a solvent of claim 33, wherein the settings include a first setting for a rate of flow of solvent employed for dissolving

the mold and a second setting for a rate of flow of solvent employed for contacting the metal.

35. The apparatus to deliver a solvent of claim 34, wherein the nozzle includes controls for adjusting the rate of solvent delivery.

36. The apparatus of claim 34, wherein the nozzle includes controls for adjusting a pressure of solvent delivery.

37. The apparatus of claim 27, wherein the nozzle includes a sprayer head.

38. The apparatus of claim 37, wherein the nozzle includes controls for adjusting a size and pattern of a spray from the sprayer head.

39. The apparatus of claim 27, further comprising a device for causing a relative movement between the at least one nozzle and the mold.

40. A molding device comprising:
a source of molten metal;
a mold for holding a charge of molten metal from said source of molten metal; and,

5 an apparatus for at least partly decomposing said mold, comprising:
a housing;
a spray nozzle mounted on said housing for spraying a solvent onto said mold; and,
a control operatively connected with said spray nozzle for
10 controlling at least one of a delivery pressure and a delivery rate of the solvent being sprayed by said spray nozzle.

41. The device of claim 40 further comprising a second spray nozzle spaced from said first spray nozzle.

42. The device of claim 41, wherein said first nozzle is located adjacent a first side of said mold and said second nozzle is located adjacent a second side of said mold.

43. The device of claim 41, further comprising a regulator for selectively actuating a spray of solvent from said first and second spray nozzles.

44. The device of claim 41 comprising a spray bar for accommodating said first and second spray nozzles.

45. The device of claim 44 further comprising a third and a fourth spray nozzle, mounted in a second spray bar spaced from said first spray bar.

46. The device of claim 45 wherein said second spray bar is vertically spaced from said first spray bar.